SYSTEM SCHEMATICS

A2091

DECEMBER, 1989

PN-314674-01

Commodore

SYSTEM SCHEMATICS

A2091

DECEMBER, 1989 **PN-314674-01**

Commodore Business Machines, Inc.
1200 Wilson Drive, West Chester, Pennsylvania 19380 U.S.A.

TABLE OF CONTENTS

NOTE

PLEASE REFERENCE A2091 USER MANUAL PN-363227-02 FOR DETAILED OPERATIONS.

A2091-40 SPECIFICATIONS

DESCRIPTION

This specification describes the Functional Requirements for an A2091-40 hard disk upgrade kit.

CONTENTS

The A2091-40 hard disk upgrade kit contains the following items:

A. A2091 Hard disk controller board
B. Cables for card-mounting hard disk drive
C. Quantum pro-drive 40S hard disk drive
D. Cable for mounting hard drive in drive bay
E. Shock mounts for hard drive
F. Stiffening rod for A2000
G. Foam pad for A2000
H. A2000HD sticker for front panel of A2000

An A2091-40 upgrades an A2000 to an A2000HD.

PARAMETERS

Dimensions:	PCB 13.25 inches; Hard drive 6 inches by 4.25 inches by 2 inches
Weight:	5 lbs.
Power requirements:	
PCB:	+12V 0.0A, +5V 1.0A
Hard drive:	+12V 1.6A, +5V 0.7A Power up; +12V 0.8A, +5V 0.6A Normal operation
Hard drive features:	42 MB formatted capacity; 19 ms seek time; supports disconnect/reselect; 64K byte look-ahead cache; 1:1 interleave

A2091 SPECIFICATIONS

DESCRIPTION

This specification describes the Functional Requirements for an A2091 hard disk controller assembly.

PARAMETERS

Dimensions: PCB 13.25 inches by 5 inches

Weight: 1 lb.

Power Requirements:

Without a hard drive mounted to card:
+12V 0.0 A
+5V 1.0 A

With hard drive mounted to card:
+12V 2.5 A max startup, 0.9 A max continuous
+5V 2.5 A continuous

Features: Hard disk controller for SCSI or XT style drives; Sockets for up to 2 MByte fast RAM; Auto-boot ROMs; Boots directly into Fast File System; Rear socket permits connection of Macintosh style SCSI expansion devices; Space on card to mount user's own 3.5″ hard drive

JUMPERS

JP1 is used to set the amount of memory on the board. It has 4 positions that represent no memory, 512K, 1M and 2M of memory.

JP2 is used to enable and disable the auto-boot ROMs. The ROMs must be disabled when the board is installed in an A2000 with KS1.2 ROMs. The position marked "AUTO" enables the auto-boot ROMs and the position marked "DIS" disables the autoboot ROMs.

JP3 determines the interrupt level that the board generates and is not user adjustable. It is factory wired to INT2.

JP5 is a software readable set of 3 jumpers. The function depends on the driver software, but with V4.4 of the driver the function is as follows:

Jumper 1:	Enable Multiple LUNs
Jumper 2:	Enable long boot timeout, disable parity check
Jumper 4:	Undefined

JP201 determines the clock rate fed into the WD33C93 SCSI controller IC. It is factory wired for a 7 MHz clock rate and is not user adjustable. If an end user would like to replace the standard WD33C93 with a high speed version of the part, the trace between the upper 2 pins of JP201 can be cut, and the lower 2 pins wired together. This would result in a 14 MHz clock rate which would effectively double SCSI throughput given a hard drive that can operate at that speed.

Factory settings are as follows:

JP1	0K (no memory)
JP2	DIS (Autoboot disabled)
JP3	INT2
JP5	ALL 3 functions disabled
JP201	7 MHz

CONNECTORS

CN1 (Not labeled on board) 100 pin Amiga edge card connector
Designed to plug into a standard A2000 100 pin Amiga slot.

CN2 XT LED
This is designed to accept the plug from the hard disk LED on the front panel of the A2000 if the user is using an XT drive. This connector will light the front panel LED whenever the XT drive is accessed.

CN3 SCSI LED
This is designed to accept the plug from the hard disk LED on the front panel of the A2000 if the user is using a SCSI drive. This connector will light the front panel LED whenever any SCSI device is accessed.

CN4 XT drive connector
This 40 pin connector is designed to attach to a ribbon cable that connects to an XT hard drive.

CN5 External SCSI connector
This DB25 connector is designed to connect the A2091 to external SCSI devices. It uses a pinout identical to the Apple Macintosh (R) SCSI connector and has the capability of connecting to any peripheral that is designed to connect to the Macintosh (R). Up to 7 external devices may be connected by daisy-chaining.

CN6 Internal SCSI connector
This 50 pin header is designed to attach to 1 or more (up to 7) internal SCSI devices. Multiple devices are connected by crimping multiple connectors onto 1 ribbon cable.

CN7 Power connector
This 4 pin molex connector supplies power to a 3.5" hard drive that the user may install on the A2091. The maximum power that may be drawn from this connector is as follows:

+12V: 2.5A max startup (8 sec), 0.9A max continuous; +5V: 1.5A max continuous

MOUNTING OF HARD DRIVE

Space is provided on the A2091 for the end user to mount a 3.5 inch hard drive. Mounting hardware is not included, and a cable is required to allow the hard drive to draw its power from the A2091, CPN 312646-01.

A2091 MAJOR PARTS LIST

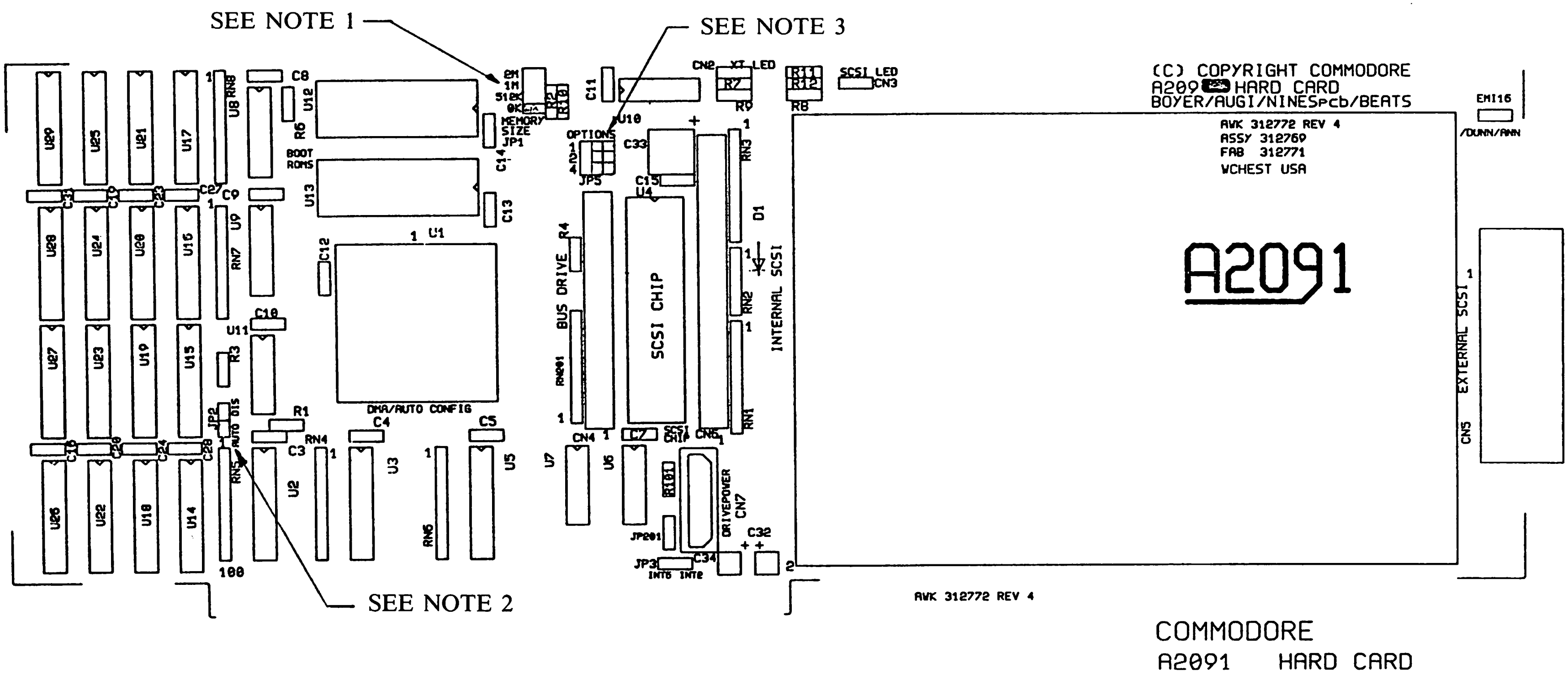
313441-01		A2091-40 SHIPPING ASSEMBLY-U.S.
313441-02		A2091-40 SHIPPING ASSEMBLY-GERMANY
313441-03		A2091-40 SHIPPING ASSEMBLY-EFIGS.
313441-04		A2091-40 SHIPPING ASSEMBLY-SCANDI.
313441-05		A2091-40 SHIPPING ASSEMBLY-CANADA
313441-06		A2091-40 SHIPPING ASSEMBLY-AUSTRALIA
363243-01		BULK PACKING BOX
363242-02		PACKING BOX
318900-01		WARRANTY CARD U.S.
318882-01		WARRANTY CARD CANADA
318884-01		WARRANTY CARD AUSTRALIA
314877-02		SERVICE CENTER LIST U.S.
363033-01		A2091 USER MANUAL - EFIGS
363034-01		A2091 USER MANUAL - SCANDI
363227-02	C	A2091 USER MANUAL - ENGLISH
252253-12		PLASTIC BAG
317806-01	C	DISKETTE - INSTALL (US)
317807-01	C	DISKETTE - INSTALL (GER)
318896-01		SOFTWARE LICENSE U.S. & CANADA
312341-02		DISKETTE REPLACEMENT CARD (US)
318556-02		DISKETTE REPLACEMENT CARD (CANADA)
312773-01		A2091 MAIN ASSEMBLY
312778-01		BRACKET, MOUNTING (ON MAIN ASSY)
906610-01		SCREW PHILIPS 6-32 (QTY=4, MAIN ASSY)
905970-04	C	NUT, KEPS 6-32 (QTY=8, 4 ON MAIN ASSY, 4 FOR HD MOUNT)
316754-01		UPC LABEL
312646-01	C	CABLE, POWER
312573-01	C	CABLE, DATA 50P SHORT
313439-01	C	CABLE, DATA 50P LONG
313440-01	C	DRIVE, HARD 40MB SCSI QUANTUM
312713-01	C	TIE BAR
312748-01	C	ISOLATOR, VIBRATION
311554-01	C	NAMEPLATE (AMIGA 2000HD STICKER)
312749-01	C	FOAM SUPPORT
907272-02	C	WASHER, FLAT
905960-04	C	NUT, HEX M3
312769-01	C	A2091 PCB ASSEMBLY - REV 4
312770-01		SCHEMATIC - PCB REV 4
312771-01		FABRICATION - PCB REV 4
312772-01		ARTWORK - PCB REV 4

COMPONENT PARTS LIST
PCB ASSEMBLY #314386-03

Commodore part numbers are provided for reference only and do not indicate the availability of parts from Commodore. Industry standard parts (Resistors, Capacitors, Connectors) should be secured locally. Approved cross-references for TTL chips, Transistors, etc. are available in manual form through the Service Department, order #314000-01.

IC COMPONENTS		
390333-03	16L8A RAM CONTROLLER	U5 PROGRAMMED INTO P/N 390071-02
390332-01	74F158A	U8,U9
901521-46	74LS245	U2,U3
390563-02	DMAC	U1
390206-01	WD33C93	U4
901522-30	7407	U7
390617-01	74ALS32	U11
901521-03	74LS08	U10
901521-32	74LS86	U6
390509-02	EPROM PROGRAMMED, ODD DRIVER	U12 PROGRAMMED INTO P/N 380204-01
390508-02	EPROM PROGRAMMED, EVEN DRIVER	U13 PROGRAMMED INTO P/NB 380204-01
MISCELLANEOUS		
904150-08	SOCKET 20 PIN IC	U5,U14-29
904150-05	SOCKET 28 PIN IC	U12,U13
904150-06	SOCKET 40 PIN IC	U4
390185-01	SOCKET 84 PIN IC	U1
251842-02	FILTERS EMI 100pF	EMI 16
390017-01	DIODE 1N914	D1
390331-01	CONN POWER 4 PIN	CN7
316755-01	LABEL, FCC ID A2091	

RESISTORS		
901550-105	33 OHM 1/4W	R1,3,9-11
901550-01	1 K OHM 1/4W	R2,4,6,8,101
901550-49	100 OHM 1/4W	R12
901550-131	56 OHM 1/4W	R7
380388-04	220/330 OHM/10PIN/8 ELEMENTS/SIP	RN1,RN3
380388-01	220/330 OHM/6PIN/4 ELEMENTS/SIP	RN2
390227-04	33 OHM/10PIN/9 ELEMENT/SIP	RN6-RN8
902410-08	4.7 K/10PIN/9 ELEMENT/SIP	RN4,RN5
902410-06	3.3 K/10PIN/9 ELEMENT/SIP	RN201
CAPACITORS		
900020-09	.33uF, RADIAL LEAD, Z5U	C3-5,7-16,19,20,23,24, 27,28,31
251894-24	ELECT RADIAL LEAD 22uF 16V	C32,33
CONNECTORS		
903345-25	50 PIN, DIL	CN6
903345-20	40 PIN, DIL	CN4
903332-03	3 PIN, SIL	CN3,JP2
390241-05	25 PIN "D" SUB, RIGHT ANGLE	CN5
903345-04	HEADER 2 BY 4	JP1
903345-03	HEADER 2 BY 3	JP5
390333-01	JUMPER	

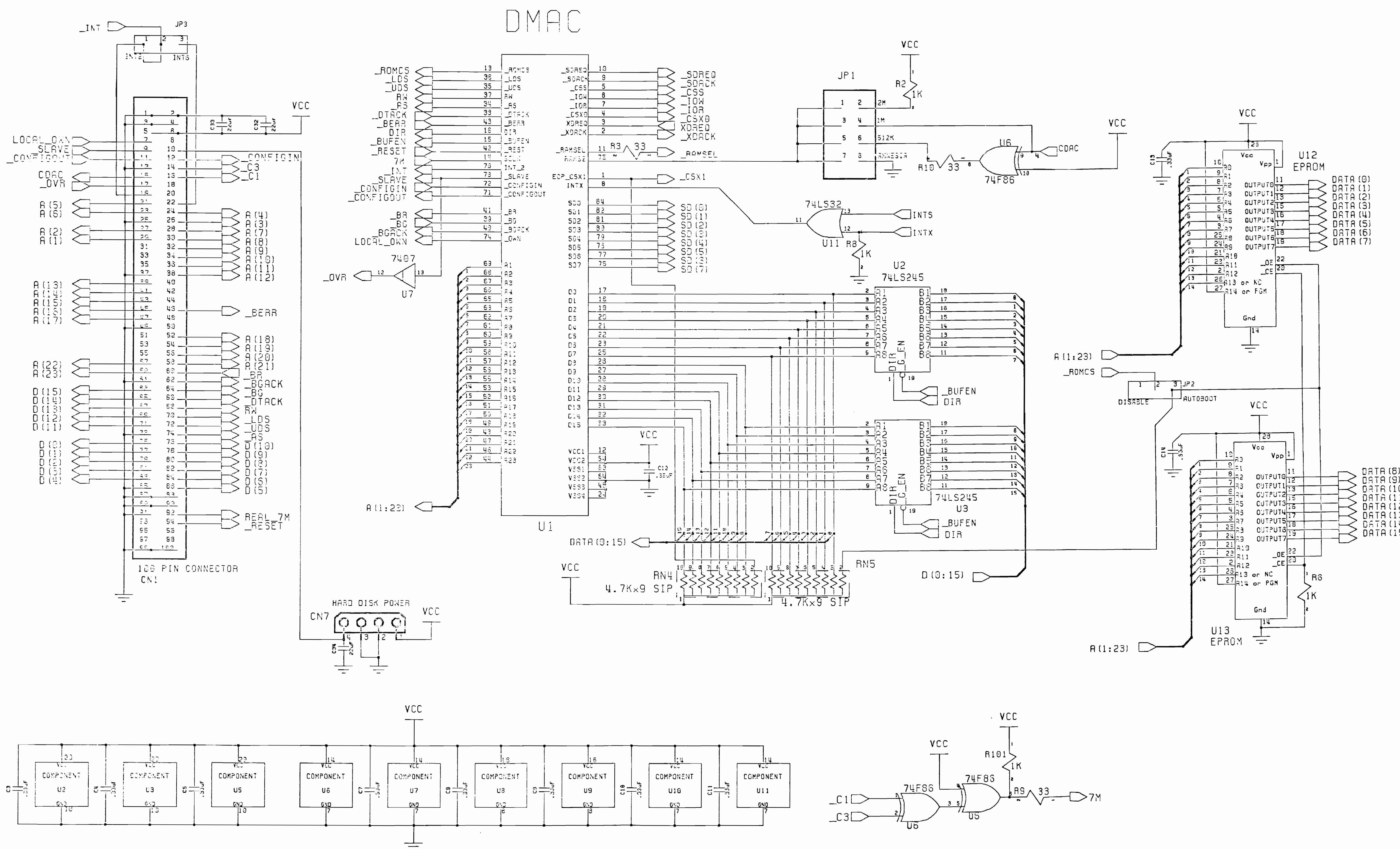


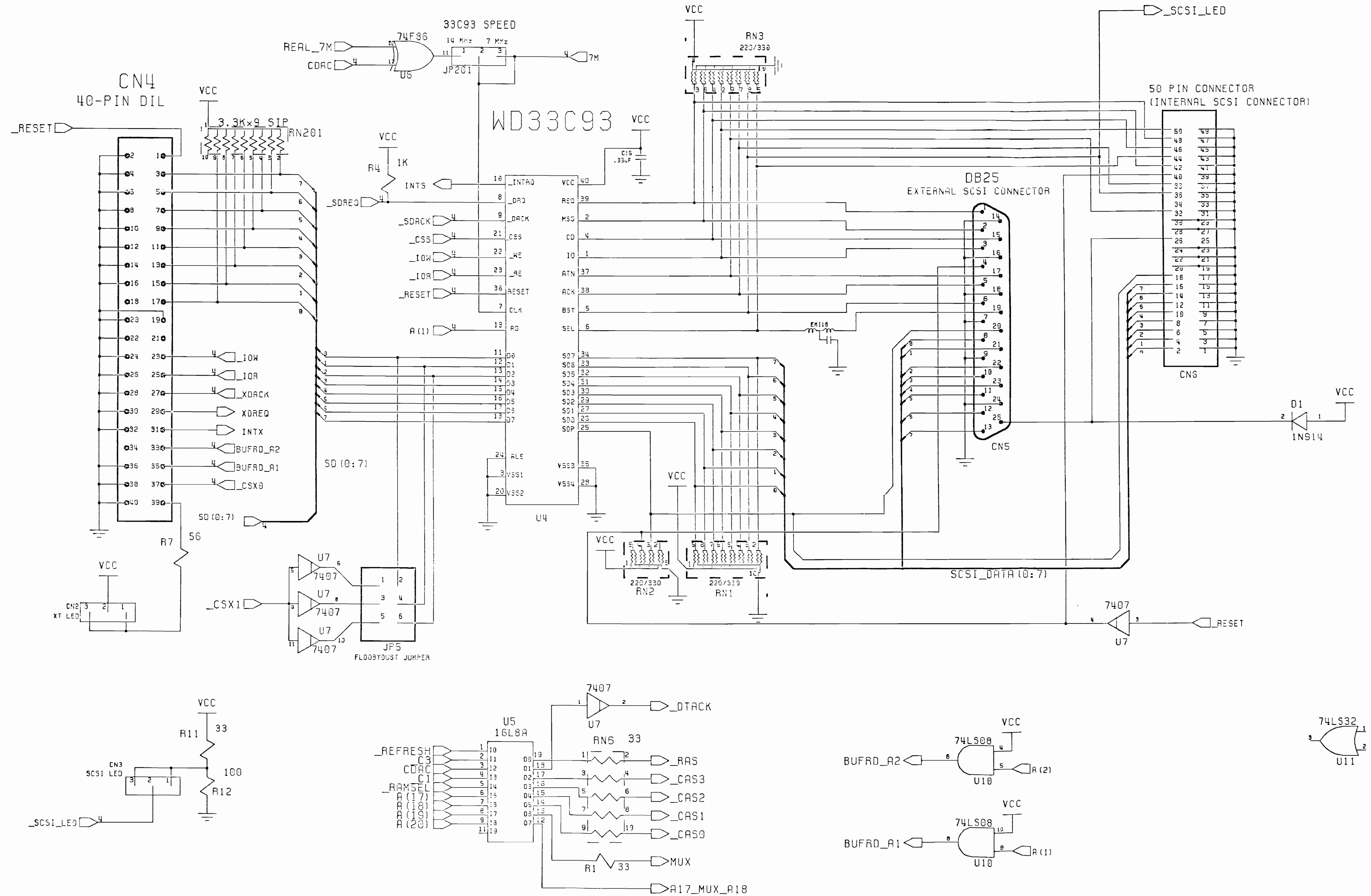
NOTES: (UNLESS OTHERWISE SPECIFIED)
1) SET ONE JUMPER ON JP1 IN "OK" POSITION.
2) SET ONE JUMPER ON JP2 IN "AUTO" POSITION.
3) SET THREE JUMPERS ON JP5 BUT ONLY ON 1 PIN.

PCB Assembly #314386-03

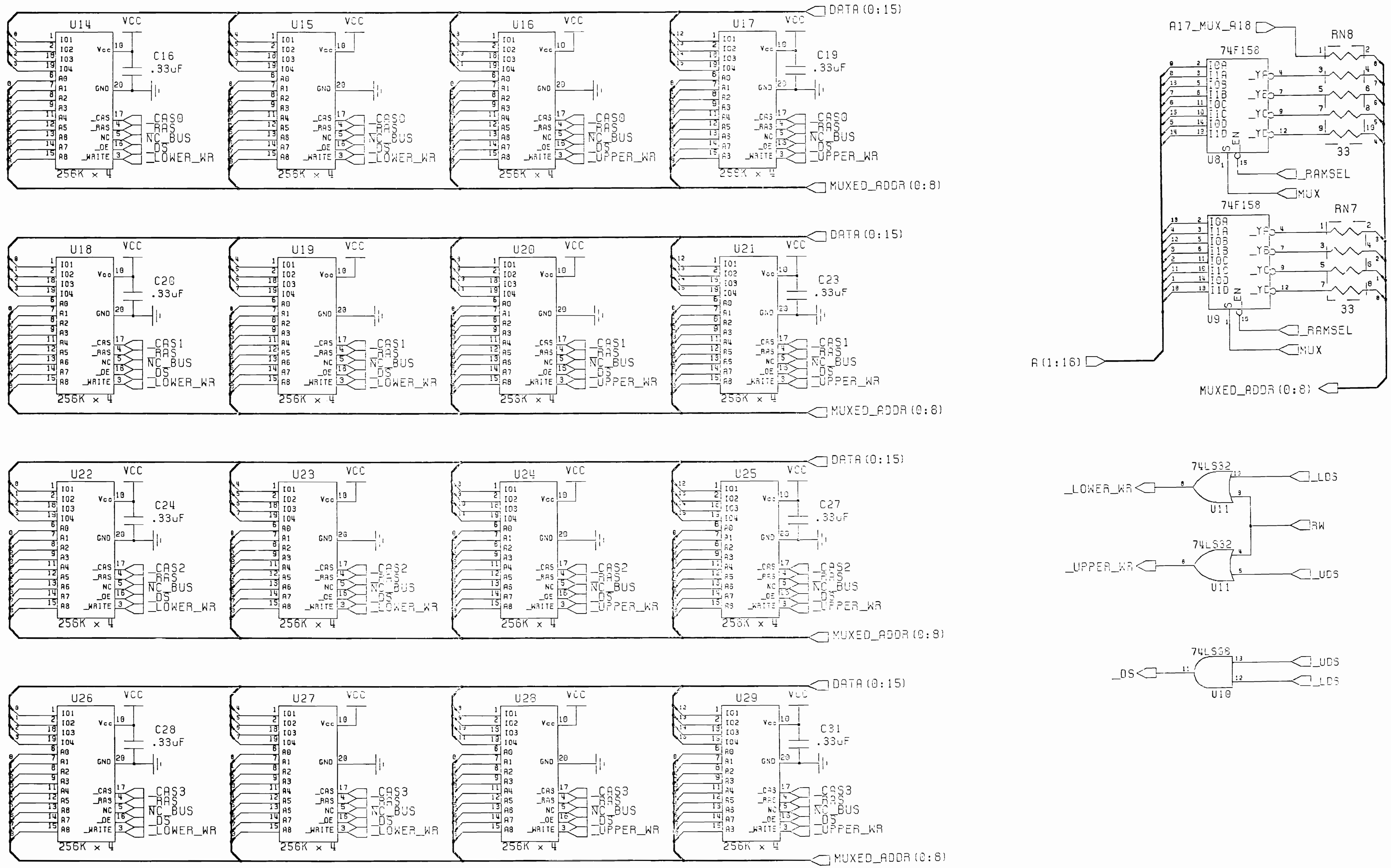
Schematic #312770

Sheet 1 of 3




CN4
40-PIN DIL
_RESET
VCC
3.3K×9 SIP
RN201
R4
1K
_SDREQ
INTS
_SDACK
_CSS
_IOW
_IOR
_RESET
A(1)
REAL_7M
CDAC
74F86
U5
33C93 SPEED
14 MHz
7 MHz
JP201
7M
WD33C93
VCC
C15
.33uF
_INTRQ
_DRQ
_DACK
_CSS
_WE
_RE
RESET
CLK
A0
D0
D1
D2
D3
D4
D5
D6
D7
ALE
VSS1
VSS2
REQ
MSG
CD
IO
ATN
ACK
BST
SEL
SD7
SD6
SD5
SD4
SD3
SD2
SD1
SD0
SDP
VSS3
VSS4
U4
_IOW
_IOR
_XDACK
XDREQ
INTX
BUFRD_A2
BUFRD_A1
_CSX0
SD(0:7)
R7
56
CN2
XT LED
_CSX1
U7
7407
JP5
FLOOBYDUST JUMPER
RN3
220/330
DB25
EXTERNAL SCSI CONNECTOR
CN5
EMI10
RN2
RN1
220/330
SCSI_DATA(0:7)
_SCSI_LED
50 PIN CONNECTOR
(INTERNAL SCSI CONNECTOR)
CN6
D1
1N914
_RESET
R11
33
100
R12
CN3
SCSI LED
_SCSI_LED
U5
16L8A
_REFRESH
C3
CDAC
C1
_RAMSEL
A(17)
A(18)
A(19)
A(20)
_DTACK
RN6
33
_RAS
_CAS3
_CAS2
_CAS1
_CAS0
MUX
R1
A17_MUX_A18
74LS08
U10
BUFRD_A2
A(2)
BUFRD_A1
A(1)
74LS32
U11

Schematic #312770
Sheet 3 of 3



NOTE: NO CONNECT ON DRAM'S ARE CONNECTED TOGETHER TO FACILITATE FUTURE CONVERSION TO 4M PART (1M X 4)

commodore
COMPUTERS

Computer Systems Division
1200 Wilson Drive
West Chester, PA 19380